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ABSTRACT

This study examined research on children's block play, using content analysis to review 75 documents that focused on such play. Each document was coded by type (empirical study or nonempirical article) and by 15 topics and 76 subtopics grouped into 4 broad categories: (1) environment/ecology; (2) block play and the school curriculum; (3) block play and child development; and (4) developmental stages of block play. Subtopic analysis resulted in a total of 959 coded items, exclusive of gender and age variables, which were analyzed separately. It found that statements concerning the environment and ecology of children's block play accounted for 37.12 percent, references concerning block play and school curriculum accounted for 25.34 percent, references to block play and child development accounted for 22.42 percent, and references to the developmental stages of children's block play accounted for 15.12 percent of the coded items. Comparisons between the topics addressed by empirical and non-empirical studies are reviewed. (Contains 48 references.) (MDM)

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Content Analysis of Block Play Literature

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Content Analysis of Block Play Literature

Children construct knowledge and understanding of the world through their play experiences. This belief in the benefits of play has been well supported by the theories and research of the past century (Johnson, Christy, & Yawkey, 1987; Katz & Chard, 1989; Vygotsky, 1962). A growing body of literature indicates that block play is particularly appropriate for meeting the developmental needs of young children, providing opportunities for social, physical, and cognitive growth. While the professional literature concerning children's play is vast, however, the portion of it which deals with block play is still relatively small. It is also relatively disorganized, with few systematic attempts to collect and interpret empirical support for its claims. One of the primary objectives of this study was to characterize the content of the professional literature concerning block play through content analysis. This detailed picture may provide the basis for curriculum and research decisions regarding the role of block play in the education of young children.

Block play is what children do when they handle, stack, or otherwise manipulate blocks; it is their active engagement with the materials (Provenzo & Brett, 1983). Play theories suggest that children engaged in block play can practice and consolidate skills, demonstrate flexible thinking and behavior, and develop abstract thinking by using objects as representative props (Piaget, 1962; Vygotsky, 1976). Several empirical studies examining the uses and benefits of children's block play show its multidimensional impact on children's construction of physical, logico-mathematical, and social knowledge (Donnelly, 1985; Garlikov, 1990; Kinsman & Berk, 1979; Reifel, 1981; Reifel & Greenfield, 1982). As schools serving young children focus on creating interactive and meaningful learning environments, blocks are emerging as a practical and productive context for cooperative learning. Thus block play appears to have both theoretical and practical significance for young children's learning and development in the classroom.

Given that block play is a popular and recommended part of early childhood education, a systematic attempt to characterize what has been written about it may provide teachers and researchers with a foundation for making appropriate decisions about the use of blocks in early childhood settings. A detailed analysis of block literature content can provide teachers with support for using blocks as an integral component of their curriculum. Evidence of the ways children can learn and benefit from blocks may guide teachers and curriculum specialists as they tailor block activities to maximize educational benefits for individual children. Further, researchers who are interested in various aspects of children's block play will find that such an analysis maps out different areas of interest, identifies topics that have been empirically investigated, and reveals areas requiring further exploration and systematic investigation.

Content analysis was chosen as the research method because it is a well-documented

tool for "making replicable and valid inferences from data to their context" (Krippendorf, 1980, p. 21), and as a research strategy it is particularly well-suited to a detailed analysis of a body of text documents. In traditional content analysis, texts are analyzed according to how frequently certain designated words or phrases appear. The researcher assumes that these frequencies imply something significant and makes inferences about the nature of the research topic based upon them (Weber, 1985). The process can be applied to large body of documents; in this case, the frequency with which particular subjects or themes are addressed throughout the literature is assumed to reflect a level of professional interest or the degree to which the topic has been investigated. The systematic nature of the procedure means that the researcher can transform frequency data into evidence of attitudes or trends, which may be replicated in other studies (Ellis & Favat, 1966). Content analysis can thus be an objective and systematic way of determining what is being said about a certain subject.

Related Literature

Existing literature on children's block play addresses a wide variety of topics, with four broad themes emerging during preliminary analysis: (1) the environment and classroom ecology of block play, (2) block play and the school curriculum, (3) contributions of block play to children's development, and (4) building stages and skills associated with block play.

Within the theme of the ecology of block play, topics in the literature include types of blocks (Franklin, 1950), arrangement and storage of blocks in the classroom (Banta, 1980; Cartwright, 1988), accessories and props to extend block play (Gelfer & Perkins, 1987), amount of time children should spend in block play (Banta, 1980; Cuffaro, 1984), grouping of children for block play (Hartley, Frank, & Goldenson, 1952) and the teacher's role in designing block play experiences for young children (Bullock, 1992; Dreier, 1984; Kuschner, 1989; Moore, 1991; Werbizky, 1991).

As block play has been integrated into early childhood classrooms, teachers and researchers have attempted to assess the potential contributions of block play to academic development. The use of blocks to explore mathematical and scientific concepts (Cartwright, 1990; Moffitt, 1984), foster literacy development (Allegeier, 1991; Donovan, 1986; Fueyo, 1990; Isbell & Raines, 1991), increase the depth of dramatic play (Donnelly, 1985), and encourage planning and problem-solving (Fishman & Dangler, 1950) has been examined and used to support curriculum recommendations.

A large proportion of existing block play literature addresses the contributions of block play to young children's socioemotional development (Brody, 1984; Cartwright, 1988; Reifel & Yeatman, 1990; Rogers, 1985), their physical development (Bailey, 1933), and their cognitive development (Garlikov, 1990; Goodson, 1982; Piaget, 1962; Reifel & Greenfield, 1982). Gender and age as variables which affect children's block play have also been explored (Farrell,

1957; Forman, 1982; Hubner, 1980; Kinsman & Berk, 1979; Pellegrini, 1983; Reifel, 1984; Reifel & Greenfield, 1983).

Block play can also be characterized by the stages that children go through as they play with blocks (Forman, 1982; Johnson, 1984; Reifel, 1984). In addition, the development of certain construction skills, such as stacking, balancing, and arching, has been associated with early childhood block play (Banta, 1980; Forman, 1982).

The above represent only the most general categories into which block play literature may be organized, and in this form their usefulness is limited. Teachers and researchers who wish to make curriculum decisions based on professional literature require more precise information; strands must be drawn together so that conclusions about children's block play are based on clear evidence. Likewise, certain recurring themes and gaps in the research base are not evident when the data is so loosely organized.

A more useful analysis would calibrate these broad themes into detailed descriptions of the actual concept or activity which is being described. For example, Leeb-Lundberg (1984) and Cartwright (1988) address the same theme: the contributions of block play to children's mathematical thinking. However, the former discusses children's block play experiences in terms of their discovery of patterns and relationships, geometric shapes, spatial relations, and number concepts, while the latter is largely concerned with block play as a context for finding meaningful relationships, experimentation, and problem solving. The more finely-grained analysis yields important information about the researchers' interests, assumptions, and conclusions about blocks in the school curriculum.

Research Questions

The primary research question that was investigated, then, is in what ways can professional literature about block play be characterized? This study examined block play literature through a detailed content analysis of the four main themes described above. This analysis determined the frequency with which certain issues are addressed in block play literature and, by focusing on specific subtopics within each of these themes, created a detailed map of the precise nature of our knowledge about children's block play.

Once the literature was characterized according to the presence of these topics and subtopics, related questions were addressed. For example, what implications do these characteristics have for block play in real classrooms? For which areas do reliable bodies of evidence exist to support teacher practices? Have theories about children's block play been adequately supported by the research, and are suggested classroom practices based on well-supported theories? Of the 75 articles included in this study, only 31 are empirical studies; the remainder consist of recommendations for material and classroom designs, teachers' anecdotal records, and descriptive articles by early childhood teachers and researchers. One of the ways in

which data was coded, then, was according to its source. This information and the frequency data form the basis of the descriptive analysis of block play literature.

Method

Berelson (1952) defines content analysis as "the objective, systematic, and quantitative description of the manifest content of communication" (p. 18). The purpose of the content analysis of block play literature was to determine, in a systematic and quantifiable manner, what topics have been addressed by the professional educational community (in short, what this literature "says" about block play). Because this body of literature is relatively small, the sample for this study included every article which addresses children's block play that was retrievable through ERIC searches, cross-referenced in found sources, or located through other means.

The first step in content analysis is to determine the parameters of the unit of analysis. Within the body of block play literature, each document was analyzed as a unit. A ClarisWorks spreadsheet was used to record codes for each document. Initial coding designated each document as either an empirical study or non-empirical article.

Tesch (1990) states that "the basic procedure in content analysis is to design categories that are relevant to the research purpose and to sort all occurrences of relevant words or other recording units into these categories" (p. 79). This classifying, sorting, and counting data according to categories produces the frequencies which are then interpreted as evidence. The usefulness of content analysis, therefore, depends upon how closely the description of what is being counted corresponds to the research purpose; or, as Berelson (1952) puts it, "Content analysis stands or falls by its categories" (p. 147). Stone et al. (1966) describe categorical coding as a two-step process: the researcher must first create specific content characteristics (categories) to be measured and then define rules for identifying the characteristics when they occur in the data. Preliminary analyses of the documents which address block play indicated that in addition to the four broad themes discussed above, the content may be further divided into related topics and subtopics. A preliminary list of 21 topics and 81 subtopics was created, and over the period of data collection was refined to a final coding list of the following 15 topics and 76 subtopics:

I. Environment/Ecology

- **a. time:** length of time children play with blocks per week, day, or project
- **b. set-up:** location and size of the block center in a classroom, traffic patterns, types of blocks, storage, other materials to include in the block area
- **c. students:** number of children in a given area, planning for solitary and group play, rules for the block area, consequences of breaking rules
- **d. teacher's role:** designer of the block area, observer of children's play, evaluator of student learning, resource for student questions, facilitator

II. Block Play and the School Curriculum

a. **mathematics:** geometry, size, shape, patterns, part-whole relationships, measurement, scale, order, number, logic

b. **science:** systems, cause and effect, comparisons, stability, balance, gravity

c. **literacy:** language development, emergent literacy, labeling, symbolic representation

d. **social studies:** communities, jobs, mapping, relationships

e. **art:** patterns, symmetry, decoration, aesthetics, self-expression

f. **integrated curriculum**

III. Block Play and Child Development

a. **social:** cooperation, responsibility, sharing, respect

b. **emotional:** affect, feelings of autonomy, initiative, self-esteem, satisfaction, mastery; exploration in dramatic and role play

c. **physical:** motor skills, coordination, visual perception/discrimination

d. **cognitive:** thinking/cognition, abstract thinking, planning, problem-solving, creativity

IV. Developmental Stages of Block Play

a. **stages:** sequence, content, carrying, stacking, bridging, enclosure, patterns, balance, symbolism, representative building

The second step in the coding process was creating the rules for identifying these units when they occur in the literature. What constitutes an occurrence of a particular category, topic, or subtopic? How can it be defined so that another researcher would code identically? For this study, the presence of the previously listed words describing topics and subtopics were considered as evidence that the subject was addressed only if the context supported this conclusion. The words "emotional development," for example, were sometimes listed as an area related to block play, while at other times the topic was addressed at some length within a particular article. A context which included several related sentences containing and discussing the key word(s) -- in short, more than a single or undeveloped appearance within the text -- was considered supportive. Coding for each document was thus based on both the presence of specific terms and the context in which the terms occurred. This method of coding by "significant mention" meant that once a document was coded for a specific subtopic, subsequent appearances of that subtopic within the document were not coded; one significant mention was considered adequate to support the conclusion that the topic or subtopic had been addressed. To increase the reliability of the coding method, some documents were coded twice, at different stages of the process. Original and later codes were compared to ensure that the unit definitions were consistent over time.

Each document was thus coded in four ways. First, it was identified as an empirical study or non-empirical article. As it was read, the presence of subtopics was noted by coding the appropriate cell on the spreadsheet. After all of the articles had been coded for subtopics, the subtopics were sorted into their corresponding topics, which fell into the appropriate category of Environment/Ecology, Curriculum, Child Development, or Development of Block Play.

Once all data were coded, the absolute and relative frequency of each unit and its presence in an empirical or non-empirical study was determined. The final tally for each theme, topic, and subtopic was interpreted as evidence of researcher interest, patterns of investigation, and recommendations for future study.

Findings

This analysis examined 75 documents concerning children's block play, of which 41.3% (n=31) were empirical studies. Each document was coded for the presence of specific topics and subtopics in four broad categories, as previously described. This subtopic analysis resulted in a total of 959 coded items. Age and gender variables were analyzed separately, resulting in an additional 99 coded units, which were not included in the total (n=959) used to calculate relative frequencies. To simplify data presentation, frequencies of empirical and non-empirical references to topics and subtopics are listed by category in Tables 1 - 9.

Environment/Ecology

Statements concerning the environment and ecology of children's block play accounted for 37.12% (n=356) of the total items coded in this study (n=959). Of these references, 21.63% (n=77) came from empirical studies. Frequency results of topics and subtopics in this category are presented in Tables 1 and 2.

The topic of time and children's block play accounted for 6.47% (n=23) of all references to the environment and ecology of children's block play, with empirical references numbering five (21.74%). Time was further analyzed as time spent in block play per week, per day, and per project. No empirical study mentioned time spent per week.

Concerns in the set-up of a classroom block area accounted for 38.76% (n=138) of the coded items in this category. Empirical references to set-up issues accounted for 18.12% (n=25) of these. Subtopics of this category included the location and size of the area, the relationship of the block area to classroom traffic patterns, types of blocks (such as unit or hollow blocks) and the attributes of those blocks, issues in block storage, and supplementary materials or accessories to be stored with blocks for children's use in the block area. No empirical study included a reference to traffic patterns.

Issues concerning children's use of the block area accounted for 20.51% (n=73) of the coded items in this category. Of these, 34.25% (n=25) were found in empirical studies.

Subtopics included the number of children allowed in the block area at any one time, opportunities for solo and group play, and the establishment of block area rules and consequences. No empirical study mentioned consequences.

Statements concerning the role of the teacher during children's block play accounted for 34.27% (n=122) of the coded items in this topic. Empirical studies yielded 18.85% (n=23) of these. The role of the teacher in children's block play was examined according to five subtopics: the teacher as the designer of a classroom block area, the teacher as an observer of children's block play, the teacher as the evaluator of children's learning in the block area, the teacher as a resource for children's questions during block play, and the teacher as a facilitator of learning in the block area, i.e., as someone who designs specific activities for the block area and poses questions at particular times to encourage thinking, discussion, etc.

Block Play and the School Curriculum

References within the category of block play and the school curriculum accounted for 25.34% (n=243) of the total number of items coded in this study. Of these references, 25.10% (n=61) came from empirical sources. Tables 3 and 4 contain absolute and relative frequencies of the topics and subtopics in this category.

Block play and mathematics accounted for 30.04% (n=73) of the coded references in this category. The number of empirical references to math concepts was 15, or 20.55% of the total references to mathematics. The topic was further divided and analyzed by the following subtopics: geometric concepts learned through block play, comparisons of size and shape, pattern recognition, understanding of part-whole relationships, experiences with measurement, concepts of scale and order, practice with number and counting, and the development of logic. No empirical study included references to geometry, measurement, scale, or number.

Block play and the science curriculum accounted for 11.11% (n=27) of the coded references in this category. Empirical references accounted for 11.11% (n=3). Subtopics included understanding block structures as systems, learning cause and effect, practice making comparisons between blocks and block structures, and rules of stability, balance, and gravity. No empirical study referred to systems or gravity, and only one instance of each of the other subtopics was found.

The topic of block play and literacy accounted for 32.92% (n=80) of the total coded items in this category. Empirical studies contained 32.50% (n=26) of these. The analyzed subtopics included the development of spoken language, characteristics of emergent literacy, instances of labeling, and the relationship of block play to symbolic representation.

Social studies and block play accounted for 10.29% (n=25) of the curriculum category. Empirical studies contributed 4.00% (n=1) to the total. Related subtopics included recreating and understanding communities and jobs, practice with mapping, and identifying relationships

between people and businesses in communities. No empirical study contained references to the subtopics of communities, jobs, or mapping, and only one study was coded for community relationships.

Art and block play contributed 12.76% (n=31) to the total number of coded items in this category. Empirical studies contained 22.58% (n=7) of these references. Art subtopics included creating and using patterns, working with issues in symmetry, decorating block structures, developing a sense of aesthetics, and using block constructions as a form of self-expression.

A final topic within this category, the relationship of block play to an integrated curriculum, accounted for 2.88% (n=7) of the coded items. Empirical studies contained 42.86% (n=3) of these references. No subtopics of integrated curriculum were examined.

Block Play and Child Development

References to block play and child development accounted for 22.42% (n=215) of the total number of items coded in this study. Of these references, 21.86% (n=47) came from empirical studies. Frequency distributions for topics and subtopics in this category may be found in Tables 5 and 6.

Social development and block play accounted for 20.47% (n=44) of the total for this category. Empirical studies contributed 13.63% (n=6) of these. Related subtopics included the potential of block play to influence the development of cooperative behavior, a sense of responsibility, sharing, and respect for other people, their ideas, and their work. No empirical study contained references to responsibility or sharing.

Block play and children's emotional development produced 20.00% (n=43) of the coded references in this category. Empirical studies contributed 20.93% (n=9) of these. Subtopics included the ability of block play to affect children's emotions, the development of feelings of autonomy, initiative, self-esteem, satisfaction, and mastery, and the relationship of dramatic play with blocks to children's emotional development. No empirical studies mentioned self-esteem or satisfaction, and autonomy, initiative, and mastery were mentioned only once.

Physical development and block play accounted for 12.56% (n=27) of this category's total number of coded items. Empirical studies included 3.70% (n=1) of these. Subtopics included the development of fine and gross motor skills, hand-eye and muscular coordination, and opportunities to develop visual perception and discrimination skills. Empirical studies included one reference to the latter subtopic, and no references to motor skills or coordination.

The potentials of block play for children's cognitive development accounted for 36.74% (n=79) of the total number of coded items in this category. Empirical studies contained 27.85% (n=22) of these. Subtopics included ways that block play can affect thinking and cognition, aid in the development of abstract thinking, provide opportunities for planning and problem solving, and allow children to develop and express creative thought and action.

Developmental Stages of Block Play

References to the developmental stages of children's block play accounted for 15.12% (n=145) of the total number of coded items in this study. Of these, 34.48% (n=50) came from empirical sources. Tables 7 and 8 display information regarding the frequencies of topics in this category. Coded references in this category referred to the content and sequence of stages in block play development and the specific stages of carrying, stacking, bridging, enclosing, creating decorative patterns, symbolic building for dramatic play purposes, representational building, and the role balance plays in the construction of increasingly complex structures.

Other Variables

Table 9 shows the distribution of frequencies of age and gender in articles and studies about children and block play. Many articles addressed block play in terms of more than one of the following age groups: nursery and preschool-aged children (n=39), children in kindergarten (n=31), and children in the lower primary grades (n=29). Gender was mentioned 23 times in the literature, with 14 empirical studies using gender as a variable.

Discussion and Implications

Increasing professional attention to the social and cognitive benefits of play has renewed interest in the traditional block area as an educational center in nursery, kindergarten, and primary grade classrooms. Teachers have written about their experiences with using blocks as learning tools, and recent research efforts have attempted to identify what children are doing and learning when they play with blocks. As teachers and curriculum designers begin to include blocks in planned educational experiences, this growing body of professional literature is their best source of information about young children and block play.

This study attempted to answer the question, "In what ways can this professional literature about block play be characterized?" Content analysis of 75 documents revealed the literature to be 58.67% (n=44) non-empirical and 41.33% (n=31) empirical. The results presented in the previous section describe four broad categories: the environment and ecology of the classroom block area, the relevance of block play to the early childhood curriculum, ways that children's development is enhanced through block play, and the stages children pass through as they learn to build with blocks. Numerous topics and subtopics which emerged from preliminary analysis of the literature were organized around these categories.

This analysis also compared the content of empirical and non-empirical literature in order to determine which claims and practices have empirical support. Empirical support ranged from extremely low for some topics (4% and below for social studies and physical development) to highs of 42.86% for integrated curriculum, 34.25% for children's use of the block area, and 32.50% for language development. In total, non-empirical literature made some 730 mentions

of the subtopics -- 730 claims, in a sense, about the nature of children's block play. In contrast, empirical studies made only 229. Issues concerning the similarities and disparities in frequencies, the implications of these results for classroom practices, and suggestions for further research are summarized below.

Environment/Ecology

Non-empirical literature on block play claims that time is a factor in the relative quality of children's play experiences with blocks. In particular, this literature stresses the necessity of providing enough time for children to work on projects which extend beyond a single play period. Teachers are admonished to allow structures to remain standing throughout the day, or several days, or a week, so that children can experience cycles of planning, change, and development of ideas. Empirical studies make mention of scheduling block play on a daily basis, and two mention ongoing block projects that develop over time, but in general time has not been seen as a factor in empirical studies of children's learning with blocks.

Not surprisingly, the non-empirical literature written by and for early childhood teachers stresses issues in the design and set-up of a classroom block area. In this literature, the creation of a block center is the most important factor for teachers planning children's block experiences. Teachers who wish to incorporate blocks as a learning center must deal with issues regarding available space, supplies, and storage so that their classroom can function smoothly. The empirical studies which looked at block play did not pay much attention to those issues which must concern teachers in real classrooms. Exceptions include some evidence of the potentials of different types of blocks for children's learning, and the use of accessories such as small toys and labeling materials to increase and diversify the type of learning within the block setting.

Teachers who wish to use a block area as a learning center are rightfully concerned with providing all children access to the area without crowding them, giving individual children the opportunity to play alone and with others, and establishing the kinds of rules that will allow the area to be a place of constructive play. Empirical literature has little to say about these block area logistics and focuses instead on investigating some of the different outcomes of solo and group play. Evidence does suggest that both kinds of play are possible and productive in the block area, but empirical research makes no recommendations for teachers who wish to encourage them.

Next to set-up issues, the greatest disparity between empirical and non-empirical interest in environmental issues concerned the teacher's role. Many non-empirical articles addressed this topic at length, advocating that teachers, having designed and set up a block area, should continue to stay involved with the activity by observing it and facilitating learning by continuously providing materials, questioning the builders, and taking advantage of children's questions and interests. Empirical support for these teacher roles is unfortunately not strong.

Studies tend to present teachers as passive observers of the block area, sometimes facilitating and extending the learning, but little else. The role of evaluator is particularly under represented in both samples, which does not bode well for the future of block play as a legitimate context for curriculum-driven learning in early childhood classrooms. If teachers do not have clear, well-supported guidelines for evaluating children's learning during block play, they cannot feel confident that learning is taking place. Even more importantly, they cannot communicate children's learning to parents, administrators, or other teachers. Clearly, more attention must be paid to the issue of teaching teachers to go beyond observation and begin to link observed behaviors with specific learning goals. In a sense, teachers must become researchers looking for evidence of learning -- and the definition of what that learning is must be supported by more empirical studies.

Block Play and the School Curriculum

Many of the most significant disparities between the claims of block play literature and the empirical support which exists for them occur in this category. Excepting literacy and integrated curriculum, the analysis reveals that in every other topic there are numerous claims made which have little or no empirical support whatsoever. This situation is particularly unfortunate as teachers, eager to garner administrative and parental support for establishing the block area as a viable learning center, are looking for evidence that learning does take place in the block area, and that curriculum objectives can be met there. At present, there are very few studies which have reliably examined the ways that children may learn mathematical or scientific concepts with block play, or how the content of social studies and art lessons may be explored in the block area. Until such studies are done, we have little reason to claim that children can adequately absorb these principles through block play experiences.

The exception to this situation is empirical support for children's language development as they play with blocks. Thirteen studies addressed some question(s) about how children's language is affected and improved by the social opportunities of the block area, and the related areas of emergent literacy, labeling, and symbolic representation as a forerunner of abstract thought received higher than average mentions. Even very young children engage in some level of conversation as they build, and establishing the nature and effects of this talking has been the focus of several experimental and observational studies. The attention that researchers have paid to block play and language development serves as an example of solid empirical support for classroom practices. Encouraging discussion throughout the building process, having children explain their structures to others, and providing materials for making building labels are all pro-literacy actions which are suggested in both empirical and non-empirical documents.

Block Play and Child Development

The numerous references in non-empirical articles to block play's contributions to children's cognitive development are reasonably well-supported by empirical studies. Both types of literature support the idea that blocks provide children with numerous opportunities to think, plan, and solve complex problems. The most striking difference is between the claims made for block play's contributions to children's creative development and the near-total lack of support in empirical studies. While teachers recognize and promote the opportunities for many levels of creative thought and behavior in this activity, no study exists which investigates them.

The emotional benefits of block play for children have the most empirical support when they are achieved through dramatic play in the block area. Studies have focused on the ways that children can create contexts with blocks for role playing different characters and situations, allowing them to experiment with feelings. Both empirical and non-empirical articles also stress the positive affect that many children demonstrate during block play, in particular enjoyment of handling blocks and the pleasure of engaging in active play. The main difference is that the non-empirical literature claims that blocks offer chances for children to experience certain feelings, such as satisfaction and self-esteem, which the empirical literature does not mention.

Interestingly, the empirical literature which supports block play as a means of facilitating children's language development -- principally in conversation with other children -- has little to say about the social nature of block play. Teachers make many claims about the opportunities for cooperation and negotiation in the block area (working together on structures, sharing a limited amount of space and blocks), which several empirical studies support to a lesser degree. Even a casual familiarity with children's play would suggest that the social opportunities in block play must be numerous, but they have not been adequately recorded in empirical studies. The same can be said of the physical benefits of block play, which clearly provides opportunities for fine and gross motor skill development; but the empirical literature makes no mention of these. One of the results of these gaps is that connections to curriculum goals cannot be made. If we have no real empirical support for the block area as a place where specific information and skills can be learned and practiced, the argument for using it as a learning center in early childhood classrooms is weakened.

Developmental Stages of Block Play

This was the least-mentioned category in block play literature, but it had the highest amount of empirical support. There seems to be no real question that children do pass through consistent, sequential stages as they play with blocks, with younger or inexperienced children mastering simple stacking and bridging techniques and older and more experienced children building more complex structures which represent real-life places and which facilitate their dramatic play. In non-empirical literature, teachers are often given complete descriptions of

these stages as well as recommendations for activities which correspond to the different stages and skill levels. Most of these are directly supported by the results of more than one empirical study.

Age and Gender

Many of the non-empirical articles made recommendations for teachers who work with children of all ages, from toddlers to primary graders. Except for making some recommendations based on age and developmental stage, this literature does not make many distinctions between activities for different ages. The nine documents which discussed gender usually did so to encourage teachers to give girls as much time in the block area as boys, suggesting that girls might be more likely to shy away from noise and activity. Empirical studies which included gender as a variable did not find significant differences between the ways that boys and girls play with blocks. Studies used both single-age groups and comparison groups of different ages, although twice as many studies were conducted with children under four than with children in kindergarten or primary grades. Like the non-empirical articles, empirical studies found some differences associated with age and developmental stages which corresponded to differences in the stages of block building. However, practical applications of these results were not described.

Conclusion

One of the pitfalls of using a coding process is the risk of discovering new topics or subtopics after most of the articles have already been coded. In one case a newly-found article contained variables of sufficient interest to warrant recoding all of the articles; after that, the process became too arduous. Because of this, and because the results of the study rely so heavily on the quality of the chosen categories, there is always the risk that the limited scope of the study affects its validity.

A broader limitation of any content analysis is that it only counts frequencies; it does not determine the quality of what it analyzes, nor does it fully express the depth with which a topic was addressed within a single article. This is particularly important to remember when comparing an empirical to a non-empirical article because although both may be coded for having a "significant mention" of a topic, the empirical article may be an entire study based upon that topic, while the non-empirical article may spend only a paragraph on it. A different kind of study could compare these differences, or could even throw out the "significant mention" guideline and simply code all occurrences of the word of choice. The number of claims would vastly increase with this method, as many non-empirical articles simply list areas which block play favorably affects without citing references or elaborating on the implications of such claims.

This content analysis is based on the assumption that numbers tell us something about the amount of empirical support which exists for claims made in non-empirical block play literature. They are also presumed to indicate a level of interest. The block play literature reveals that, in general, teachers and researchers are concerned with many of the same broad issues in early childhood block play. With a few notable exceptions, topic frequencies in both types of literature tend to rise and fall at the same rate. But interpretation of these numbers must be done with caution, and with an important fact in mind: while the number of empirical studies is relatively high, readers will note that very rarely did subtopics receive attention from more than a handful of separate empirical studies. In addition, among non-empirical articles there is a tendency to rely on the results of only one or two studies, and very often it is the same few studies which are cited over and over again in the literature.

Finally, it should be acknowledged that practitioners who look to professional literature to support their ideas and practices are far more likely to consult articles written for teachers -- not other researchers -- than they are to wade through empirical studies which rarely address more than two or three variables of interest at a time. The current situation with regard to block play is that non-empirical literature as a whole makes numerous recommendations to teachers, but many of these are only minimally supported by empirical studies, or not at all. Although a number of different issues are addressed in empirical studies, the results of only a few studies have been repeated and thereby inflated in literature produced for teachers' use.

Researchers who are interested in expanding our knowledge base should by all means investigate the areas which lack this empirical foundation. Yet the literature would also benefit from teachers who systematically document and publish their own work. A number of articles in this study were written by teachers, "based on" their experiences as teachers of young children who played with blocks. These are valuable insights, but they are not generalizable to other early childhood contexts: they do not constitute empirical support. By systematizing and recording their observations, teachers who are already spending time in classrooms can help to create solid, convincing evidence to support the use of the blocks in early childhood environments.

Table 1. Distribution of Frequencies and Percentages of Topics and Subtopics Relating to Environment/Ecology of Block Play
NON-EMPIRICAL RESULTS

Topic	Subtopic	Absolute Frequency	Relative Frequency Within Category (% of n=356)	Relative Frequency Within Total (% of n=959)
Time		18	5.06	1.88
	time/week	2	0.56	0.21
	time/day	4	1.12	0.42
	time/project	12	3.37	1.25
Set-Up		113	31.74	11.78
	location	14	3.93	1.46
	size	15	4.21	1.56
	traffic	9	2.53	0.94
	blocks	26	7.3	2.71
	storage	19	5.34	1.98
	materials	30	8.43	3.13
Students		49	13.76	5.11
	number	5	1.41	0.52
	solo play	9	2.53	0.94
	group play	15	4.21	1.56
	rules	15	4.21	1.56
	consequences	5	1.41	0.52
Teacher's role		99	27.81	10.32
	designer	18	5.06	1.88
	observer	24	6.74	2.5
	evaluator	9	2.53	0.94
	resource	15	4.21	1.56
	facilitator	33	9.27	3.44

Table 2. Distribution of Frequencies and Percentages of Topics and Subtopics Relating to Environment/Ecology of Block Play
EMPIRICAL RESULTS

Topic	Subtopic	Absolute Frequency	Relative Frequency Within Category (% of n=356)	Relative Frequency Within Total (% of n=959)
Time		5	1.41	0.52
	time/week	0	0	0
	time/day	3	0.84	0.31
	time/project	2	0.56	0.21
Set-Up		25	7.02	2.61
	location	1	0.28	0.1
	size	3	0.84	0.31
	traffic	0	0	0
	blocks	9	2.53	0.94
	storage	3	0.84	0.31
	materials	9	2.53	0.94
Students		24	6.74	2.5
	number	1	0.28	0.1
	solo play	9	2.53	0.94
	group play	11	3.09	1.15
	rules	3	0.84	0.31
	consequences	0	0	0
Teacher's role		23	6.46	2.39
	designer	2	0.56	0.21
	observer	9	2.53	0.94
	evaluator	3	0.84	0.31
	resource	3	0.84	0.31
	facilitator	6	1.69	0.63

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Table 3 Distribution of Frequencies and Percentages of Topics and Subtopics Relating to Block Play and Early Childhood Curriculum
NON-EMPIRICAL RESULTS

Topic	Subtopic	Absolute Frequency	Relative Frequency Within Category (% of n=243)	Relative Frequency Within Total (% of n=959)
Mathematics		58	23.87	6.05
	geometry	5	2.06	0.52
	size	11	4.53	1.15
	shape	9	3.7	0.94
	patterns	7	2.88	0.73
	part-whole	3	1.24	0.31
	measurement	6	2.47	0.63
	scale	3	1.24	0.31
	order	6	2.47	0.63
	number	7	2.88	0.73
	logic	1	0.41	0.1
Science		24	9.88	2.5
	systems	3	1.24	0.31
	cause & effect	3	1.24	0.31
	comparisons	7	2.88	0.73
	stable/balance	8	3.29	0.83
	gravity	3	1.24	0.31
Language Development		54	22.22	5.63
	speech	20	8.23	2.09
	emergent lit.	12	4.94	1.25
	labeling	8	3.29	0.83
	sym/rep	14	5.76	1.46
Social Studies		24	9.88	2.5
	communities	11	4.53	1.15
	jobs	4	1.65	0.42
	mapping	7	2.88	0.73
	relationships	2	8.23	0.21
Art		24	9.88	2.5
	patterns	6	2.47	0.63
	symmetry	3	1.24	0.31
	decoration	8	3.29	0.83
	aesthetics	4	1.65	0.42
	self-expression	3	1.24	0.31
Integrated Curriculum		4	1.65	0.42

Table 4 Distribution of Frequencies and Percentages of Topics and Subtopics Relating to Block Play and Early Childhood Curriculum
EMPIRICAL RESULTS

Topic	Subtopic	Absolute Frequency	Relative Frequency Within Category (% of n=243)	Relative Frequency Within Total (% of n=959)
Mathematics		15	6.17	1.56
	geometry	0	0	0
	size	1	0.41	0.1
	shape	2	0.82	0.21
	patterns	4	1.65	0.42
	part-whole	4	1.65	0.42
	measurement	0	0	0
	scale	0	0	0
	order	2	0.82	0.21
	number	0	0	0
	logic	2	0.82	0.21
Science		3	1.24	0.31
	systems	0	0	0
	cause & effect	1	0.41	0.1
	comparisons	1	0.41	0.1
	stable/balance	1	0.41	0.1
	gravity	0	0	0
Language Development		26	10.69	2.71
	speech	13	5.35	1.36
	emergent lit.	3	1.24	0.31
	labeling	2	0.82	0.21
	sym/rep	8	3.29	0.83
Social Studies		1	0.41	0.1
	communities	0	0	0
	jobs	0	0	0
	mapping	0	0	0
	relationships	1	0.41	0.1
Art		7	2.88	0.73
	patterns	1	0.41	0.1
	symmetry	2	0.82	0.21
	decoration	1	0.41	0.1
	aesthetics	1	0.41	0.1
	self-expression	2	0.82	0.21
Integrated Curriculum		3	1.24	0.31

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Table 5. Distribution of Frequencies and Percentages of Topics and Sublopics Relating to Block Play and Child Development
NON-EMPIRICAL RESULTS

Topic	Sublopic	Absolute Frequency	Relative Frequency Within Category (% of n=215)	Relative Frequency Within Total (% of n=959)
Social Development		38	17.67	3.96
	cooperation	17	7.91	1.77
	responsibility	8	3.72	0.83
	sharing	8	3.72	0.83
	respect	5	2.33	0.52
Emotional Development		47	21.86	4.9
	affect/emotion	15	6.98	1.56
	autonomy	5	2.33	0.52
	initiative	0	0	0
	self-esteem	6	2.79	0.63
	satisfaction	4	1.86	0.42
	mastery	4	1.86	0.42
	dramatic play	13	6.05	1.36
Physical Development		26	12.09	2.71
	motor skills	14	6.51	1.46
	coordination	8	3.72	0.83
	visual per/disc	4	1.86	0.42
Cognitive Development		57	26.51	5.94
	think/cognition	17	7.91	1.77
	abstr. thinking	8	3.72	0.83
	planning	10	4.65	1.04
	prob-solving	12	5.58	1.25
	creativity	10	4.65	1.04

Table 6. Distribution of Frequencies and Percentages of Topics and Sublopics Relating to Block Play and Child Development
EMPIRICAL RESULTS

Topic	Sublopic	Absolute Frequency	Relative Frequency Within Category (% of n=215)	Relative Frequency Within Total (% of n=959)
Social Development		6	2.79	0.63
	cooperation	5	2.33	0.52
	responsibility	0	0	0
	sharing	0	0	0
	respect	1	0.46	0.1
Emotional Development		18	8.37	1.88
	affect/emotion	6	2.79	0.63
	autonomy	1	0.46	0.1
	initiative	1	0.46	0.1
	self-esteem	0	0	0
	satisfaction	0	0	0
	mastery	1	0.46	0.1
	dramatic play	9	4.19	0.94
Physical Development		1	0.46	0.1
	motor skills	0	0	0
	coordination	0	0	0
	visual per/disc	1	0.46	0.1
Cognitive Development		22	10.23	2.29
	think/cognition	11	5.12	1.15
	abstr. thinking	5	2.33	0.52
	planning	3	1.39	0.31
	prob-solving	2	0.93	0.21
	creativity	1	0.46	0.1

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Table 7. Distribution of Frequencies and Percentages of Topics Relating to the Development of Block Play
NON-EMPIRICAL RESULTS

Topic	Absolute Frequency	Relative Frequency Within Category (% of n=145)	Relative Frequency Within Total (% of n=959)
stage content	10	6.89	1.04
stage sequence	13	8.97	1.36
carrying	8	5.52	0.83
stacking	9	6.21	0.94
bridging	7	4.83	0.73
enclosure	7	4.83	0.73
patterns	8	5.52	0.83
symbolism	13	8.97	1.36
represen. bldg.	17	11.72	1.77
balance	3	2.07	0.31

Table 8. Distribution of Frequencies and Percentages of Topics Relating to the Development of Block Play
EMPIRICAL RESULTS

Topic	Absolute Frequency	Relative Frequency Within Category (% of n=145)	Relative Frequency Within Total (% of n=959)
stage content	9	6.21	0.94
stage sequence	11	7.59	1.15
carrying	1	0.69	0.1
stacking	3	2.07	0.31
bridging	3	2.07	0.31
enclosure	2	1.38	0.21
patterns	3	2.07	0.31
symbolism	5	3.45	0.52
represen. bldg.	11	7.59	1.15
balance	2	1.38	0.21

Table 9. Distribution of Frequencies of Age and Gender

Topic	Subtopic	NON-EMPIRICAL RESULTS Absolute Frequency	NON-EMPIRICAL RESULTS Relative Frequency	EMPIRICAL RESULTS Absolute Frequency	EMPIRICAL RESULTS Relative Frequency
Age		54	54.55	45	45.45
	Below age 4	16	16.16	23	23.23
	4 - 5	20	20.2	11	11.11
	6 and over	18	18.18	11	11.11
Gender		9	39.13	14	60.87

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